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On the Action of Crystallized Bodies on Homogeneous Light, and on the Causes of the Deviation from Newton's Scale in the Tints which many of them develope on Exposure to a Polarized Ray. By J. F. W. Herschel, *Esq. F.R.S. Lond. and Edin.* Read December 23, 1819. [*Phil. Trans.* 1820, *p.* 45.]

When Malus published his discovery of the polarization of light, the list of doubly-refracting crystals was small; and as the most remarkable of them possessed only one axis of double refraction, it was presumed that the law discovered by Huyghens, applicable to that one, might hold good in all; but the discovery of crystals with two axes of double refraction has proved the fallacy of such generalization, and rendered new and extensive investigations necessary.

There are two modes of conducting observations on double refraction and polarization; the one turns upon immediate observation of the angular deviation of the extraordinary pencil, the other depends upon the separation of a polarized ray into complementary portions by the action of a crystallized lamina. After noticing the advantages of the latter, Mr. H. observes, that to render observations on the tints developed by polarized light available, they must be comparable to each other; hence the importance of discovering the existence and tracing the laws of those causes which operate to disturb their regularity. In the author's first inquiries on the polarization of light, he was struck by the great deviation from the succession of colours in their laminæ, as observed by Newton, which many crystals exhibit when cut into plates perpendicular to one of their axes; and finding this phenomenon unconnected with irregularities in their thickness or polish, and uniformly repeated in different and perfect specimens, he was led to inquire into their causes, especially as they appeared to form an unanswerable objection to M. Biot's theory, which perfectly explains the tints in crystals with one axis.

In the several sections of this communication, Mr. H. first enters into a detailed description of the phenomena themselves, which are reducible to one general fact; namely, that the axes of double refraction differ in their position in the same crystal for the different coloured rays of the spectrum, being dispersed in one plane over an angle more or less considerable according to the nature of the substance. In many bodies, the magnitude of this dispersion of the axes is comparatively trifling; while in some, not otherwise remarkable for a high ordinary or extraordinary dispersive power, it is enormous, and renders all computation of the tints in which it is not taken into consideration completely erroneous. A new element is thus developed, which for the future must enter into all rigorous formulæ of double refraction; and another striking instance is presented of the inherent distinction between the different coloured molecules of light. At the same time, says the author, by the complete explanation this principle affords of all the more perplexing anomalies in the tints, the theory of oscillations stands relieved of every difficulty, and may be received as adequate to the representation of all the phenomena of the polarized rings, and entitled to rank with the fits of easy transmission and reflection as a general and simple physical law.

A Case of the Human Fœtus found in the Ovarium, of the Size it usually acquires at the End of the Fourth Month. By A. B. Granville, *M.D. F.R.S. In a Letter addressed to Sir* Everard Home, *Bart. V.P.R.S.* Read January 13, 1820. [*Phil. Trans.* 1820, *p.* 101.]

The body, of which the dissection is described in this paper, exhibited a considerable tumour, placed immediately above the region of the pubis. Upon opening the abdomen, a quantity of fluid resembling blood was found in its cavity, and a tumour, four times the size of a hen's egg, obstructed the view of the internal parts of generation, resting upon the left portion of the anterior surface of the uterus; a blood-vessel, which proved to be a branch of the left spermatic artery, and of the size of a large crow-quill, penetrated the dense portion of this tumour, and a smaller vessel communicated with the spermatic vein. The inferior portion of the tumour presented diaphanous membranes, through which was seen a fœtus of about four months' growth.

The fact of an extra-uterine conception being thus made out, the author proceeded to examine the connection of the tumour with the neighbouring parts, and the condition of the uterus; whence it appears that the tumour was seated in the left ovarium, which had burst in three places, so as to suffer the membranous sac containing the fœtus to protrude into the cavity of the abdomen; and that by the growth of the fœtus that part of the covering of the ovarium was ultimately lacerated, which involved the placenta by which the adhesions of the latter were torn, producing the sudden and fatal hæmorrhage which killed the patient and filled the abdomen with blood.

The uterus had acquired considerable development during the period of ovario-gestation; the right ovary was healthy, as also its Fallopian tube. The left Fallopian tube was sound and loose, and its fimbriated extremity had no connexion with the neighbouring tumour.

Many other circumstances relating to the history of this case, and to the anatomical structure exhibited by the disputed parts, are contained in an explanation of Mr. Bauer's drawings, which illustrate and accompany the paper.